METHODS AND APPARATUS FOR MASKING A WORKPIECE

RELATED APPLICATIONS

This application is a continuation-in-part of U.S. patent application Ser. No. 09/940,970 by Trpkovski filed Aug. 28, 2001, which is hereby incorporated, in its entirety, by reference. The present application is related to copending and commonly assigned U.S. patent applications Ser. Nos. 10/076,211; 10/227,979; and 10/323,594, which are hereby incorporated, in their entireties, by reference.

FIELD OF THE INVENTION

The present invention relates generally to methods and apparatus for masking a workpiece. More particularly, the present invention relates to methods and apparatus for masking a planar surface of an insulating glass unit and providing information at the point of use of the insulating glass unit

BACKGROUND OF THE INVENTION

In most industrialized countries, windows touch people's lives everyday. Wherever people work and live there are windows. Windows allow the occupants of a building to view the outside world while allowing sun light to enter the interior of the building. Sunlight is a natural antidepressant and helps the human body produce vitamin D. Thus, a certain amount of sunshine is essential to mental and physical well being.

In extreme climates significant energy may be lost through windows during the winter when a building is being heated, and/or during the summer when a building is being cooled. With the rising cost of energy, efforts have been made to provide homes and other buildings with insulation that will more efficiently prevent the transfer of heat between the inside and the outside of a building. Insulating glass units have been developed to reduce the amount of heat transfer through windows.

There are basically three types of insulating glass units commercially available today. These three types are often referred to as single glazing, double glazing, and triple glazing. Double glazed insulating glass units are the most common. These insulating glass units include a space sealed between two panes of glass. This sealed space provides insulation, the insulating effect may be enhanced by filling the space with an insulative gas such as argon, or krypton. Compared with a single pane, a double glazed insulating glass unit can cut heat loss through a window nearly in half.

Because of the dramatic energy savings which can be achieved with insulating glass units, building codes in many jurisdictions have been revised to require the installation of insulating glass units. The relative energy performance of these insulating glass units is clearly an important factor to be considered when windows are purchased by a consumer. The federal government of the United States of America has developed an Energy Star designation which may be used to identify windows which meet certain energy performance criteria. In another attempt to help consumers make informed decisions regarding window purchases, the National Fenestration Rating Council (NFRC) has recently instituted new labeling requirements for windows. The NFRC requirements include both a permanent marking and a temporary label. The NFRC label includes ratings for U-factor, Solar Heat Gain Coefficient (SHGC), Visible Transmittance (VT), and air leakage (AL). These ratings must be provided for both residential and non-residential applications. All of these ratings typically vary from one window to the next. The labeling of windows may also include additional information such as a model number, the window style, the window dimensions, and a date code. This information also typically varies from one window to the next. The labeling requirements described above present a challenge to window manufacturers since a great deal of information is required, and since this information frequently varies from one window to the next.

Human beings have a relatively narrow temperature range in which they are comfortable. Unfortunately, infrared (IR) energy from the sun entering a room through a window can quickly raise the temperature to an uncomfortable level. Many windows include low emissivity coatings that have been developed to prevent heat spikes within a room by reflecting a large portion of incident infra red energy. Recently, self cleaning coatings have also been developed for use on window glass. These coatings may eliminate the need to clean the glass of an insulating glass unit.

Because the glass of an insulating glass unit typically includes special coatings, temporary labels that are applied to the glass are typically manufactured using special paper and special inks so that the coatings on the glass will not be damaged. The coatings on an insulating glass unit may also be damaged during transportation to a building site, or during the building process. The building process typically involves the efforts of a variety of crafts people such as carpenters, masons, and painters. During the building process the coatings on an insulating glass unit can be scratched or covered with paint.

SUMMARY OF THE INVENTION

The present invention relates generally to methods an apparatus for masking workpieces (e.g., multiple-pane insulating glass units). In one advantageous method in accordance with the present invention, a first strip of masking material is placed on a workpiece in a position such that a first portion of an unmasked apron of the workpiece extends between a first end of the first strip and an outer periphery of the workpiece and a second portion of the unmasked apron extends between a first side of the first strip and the outer periphery of the workpiece. A cut may be formed in the masking material to define a second end of the first strip. In some advantageous embodiments, the cut is located so that the first strip has a length selected such that a third portion of the unmasked apron of the workpiece will extend between the second end of the first strip and the outer perimeter of the workpiece when a second section of the first strip is adhered to the workpiece.

The first strip may form all or part of a protective covering. In some implementations, the protective covering comprises a plurality of strips disposed in an overlapping fashion. In some advantageous implementations, the protective covering is sized and positioned so that an unmasked apron of the workpiece extends between an outer periphery of the protective covering and an outer periphery of the workpiece. In some particularly advantageous implementations, the width of the unmasked apron is large enough so that the unmasked apron can receive a sash, and small enough so that the protective covering protects a portion of the pane that is not covered by the sash.

In some exemplary implementations the protective covering is formed using a masking material comprising a substrate having an adhesive side and a non-adhesive side.